



## Colton Schools Seismic Mitigation

### Full Mitigation Best Practice Story

#### *San Bernardino County, California*

**San Bernardino County, CA** - The Colton Unified School District, located in San Bernardino County in Southern California, has 26 elementary, middle and high schools and eight separate departmental facilities. Because the educational program combines traditional and year-round schedules, there is a high-level of occupancy and use of facilities. Year-round life safety is a major focus of the school district's preparedness and mitigation program.



San Bernardino County was seriously affected by the Landers and Big Bear earthquakes, which struck the area one hour apart in 1992. Both earthquakes caused damage to buildings. Ceilings fell. Stock and other items were thrown from shelves. School schedules were disrupted.

These events -- plus the realization that there is ongoing potential for hazards and damage to facilities in the seismically-active area (near the San Andreas fault) -- prompted the San Bernardino County Office of Education to apply for a hazard mitigation grant from FEMA. Funds are for non-structural mitigation for all school districts in the county.

The Colton Unified School District's consultant recommended mitigation solutions that would exceed life-safety standards. The first non-structural mitigation projects were done in kitchens of three schools where stoves, freezers and refrigerators were secured to prevent tipping or "walking" during earthquakes. By securing stoves, chances of breaks in gas lines and the likelihood of fires is substantially reduced. Mitigation plans also called for installation of computer hold-downs, and securing mobile carts and filing cabinets.

Work has been completed at three schools, three more will be done by June, and all facilities including remaining schools are to be mitigated by the end of the year, said Janna Waller, the Colton district's accounting director.

Funds for this project were made available from FEMA's Hazard Mitigation Grant Program, and were obtained by the San Bernardino County Office of Education for the Colton school district's non-structural mitigation effort. The HMGP grant also is paying for non-structural mitigation at other public school districts in San Bernardino County.

Non-structural retrofit projects have been demonstrated to be cost-effective mitigation, and in the case of the Colton Unified School District's project, the benefit/cost analysis shows a ratio of savings from future events to the cost of mitigation of at least one-to-one and perhaps a great deal more.

The position of the county schools office and Colton school district is that hazards can and do repeat themselves, that non-structural mitigation done to lessen effects of these hazards can greatly reduce damage and life-threatening affects of hazards, and that non-structural mitigation can last for the life of facilities.

#### Activity/Project Location

Geographical Area: **Single County (County-wide)**

FEMA Region: **Region IX**

State: **California**

County: **San Bernardino County**

### Key Activity/Project Information

Sector: **Public**  
Hazard Type: **Earthquake**  
Activity/Project Type: **Retrofitting, Non-structural**  
Activity/Project Start Date: **03/1998**  
Activity/Project End Date: **12/1999**  
Funding Source: **Hazard Mitigation Grant Program (HMGP)**  
Funding Recipient: **Critical Facility - School**  
Funding Recipient Name: **Colton Unified School District**

### Activity/Project Economic Analysis

Cost: **\$200,000.00 (Estimated)**

### Activity/Project Disaster Information

Mitigation Resulted From Federal  
Disaster? **Yes**  
Federal Disaster #: **947 , 07/02/1992**  
Value Tested By Disaster? **No**  
Repetitive Loss Property? **No**

### Reference URLs

Reference URL 1: **<http://www.nifc.gov>**  
Reference URL 2: **<http://www.oes.ca.gov/Operational/OESHome.nsf/1?OpenForm>**

### Main Points

- The Colton School District is a year round program with continued high occupancy of its facilities.
- Year-round life safety is a major focus of the school district's preparedness and mitigation program.
- A mitigation program of structural and non-structural retrofitting was undertaken by the district to increase life safety and reduce damages in the event of future earthquakes.
- Non-structural retrofit projects have been demonstrated to be cost-effective mitigation, and in the case of the Colton Unified School District's project, the benefit/cost analysis shows a ratio of at least one-to-one and perhaps a great deal more.